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CRANFIELD INSTITUTE OF TECHNOLOGY

RADIAL INFLOW TURBINE STUDY

FIRST INTERIM REPORT

by

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United States Army
EUROPEAN RESEARCH OFFICE OF THE U.S. ARMY
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<p>The radial inflow turbine is a major component used in both small gas turbines and turbochargers. Its performance is important to the success of these systems yet the detailed aerodynamics are still largely ill-defined especially in small high speed units where small passages and high velocities are involved. The problems are also often aggravated due to the requirement of larger than optimum flow rates to provide units with a maximum power to weight (or size) ratio.</p> <p>Cranfield, the US Army and Turbomach (San Diego) have instigated a program of work in which the flow processes within a small high speed radial inflow turbine are to be investigated both experimentally and theoretically. The objective of these studies is to provide a better basic understanding of the flow processes involved which will in time provide a good basis for the design of improved components. The strategy will be to use laser anemometry to probe particularly complex regions of the flow where either losses occur</p> <p style="text-align: right;">PTO</p>					
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or the definition of conditions is critical to performance. It is understood that computational studies are to be initiated by the Research Office which will compliment these studies.

Cranfield have been contracted by ERO to perform a study of a Radial Inflow Turbine unit, this unit to be provided by Turbomach of San Diego. The study is of three years duration and started 1st January, 1989.

This document forms the first progress report describing work undertaken from 1st January to 28th February, inclusive.

The work undertaken in this period has largely been concerned with negotiations with Turbomach on the terms of loan (Bailment and Confidentiality Agreement) of the rig, drawing details and the procurement (by Turbomach) of an export licence to cover the material temporarily exported to the UK under this project. These matters have now been successfully undertaken together with the preliminary design scheme required. The immediate task now involves the detailed design of rig modifications and installation. Technical collaboration with Turbomach (liaison is through Maurice Bull) is good and an interesting project is now underway.

No matters have occurred which affect the overall scope of the project and it is confidently expected that the first (and following) year's objectives will be achieved.

Amount of unused funds at the end of this period: \$175,218.

Property acquired during this period: None



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